



ثانوية التكنولوجيا التطبيقية
Applied Technology High School

SAT I

2011 / 2012

Question booklet # 2

Grade	11
Cluster	Core
Subject	Mathematics

Student Name			
Student Number		Section	

Coverage	➤ SAT I, Algebraic word problem, system of equations (2 equations and 2 variables), combining Equations. Average (Arithmetic Mean), Radicals (usage of calculator)
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1. The sum of 16 and a number x is 5 more than double of 6, What is the value of x ?

- a. 1
 - b. -1
 - c. 3
 - d. -2
 - e. 0
-

a	$f(a)$	$g(a)$
1	3	-2
2	6	1
3	2	4
4	-1	5
-1	0	7

2. Let the functions f , and g be defined by the table above. If $f(3) = b$, what is the value of $g(b)$?

- a. -2
 - b. 1
 - c. 4
 - d. 5
 - e. 7
-

3. If $x + 4y + 2z = x + 4y - 10$, what is the value of z ?

- a. -10
 - b. -5
 - c. 5
 - d. 10
 - e. 20
-

4. Mr. Hamad has \$3,000 in savings account (no interest) and plans to add \$100 per week to the account. Which of the following expressions represents the amount he will have, in dollars, after x weeks?

- a. $100x$
 - b. $100 + 3,000x$
 - c. $3,000 + 100x$
 - d. $(3,000 + 100)x$
 - e. $3,000x$
-

$$\begin{aligned} 2x + 3y &= 6 \\ 3x - 3y &= 9 \end{aligned}$$

5. In the solution to the system of equations above, what is the value of x ?

- a. 3
- b. 4
- c. 5
- d. 6
- e. 7

6. For all numbers s and t , let the operation \square be defined by $s \square t = 2t$ and let operation \bullet be defined by $s \bullet t = 2s$. Which of the following must be true?

- a. $s \bullet t = t \bullet s$
- b. $s \square t = t \square s$
- c. $s \bullet t = s \square t$
- d. $s \bullet t = t \square s$
- e. $t \square (s \bullet t) = s \bullet (t \square s)$

7. If $n = -4b$, what is $5n + 2$ in terms of b ?

- a. $-18b$
- b. $-22b$
- c. $-20b + 2$
- d. $-18b + 2$
- e. $-22b + 2$

8. If $3t + 9 = 13$, what is the value of $9t$?

- a. 3
- b. 6
- c. 9
- d. 12
- e. 15

9. 15 less than a number x is equal to the difference of double 5 and 3, What is the value of x ?
- a. 16
 - b. 18
 - c. 20
 - d. 22
 - e. 24

a	$f(a)$	$g(a)$
1	3	-2
2	6	1
3	5	4
4	-1	5
-1	0	7

10. Let the functions f , and g be defined by the table above. If $g(f(a)) = 7$, what is the value of a ?
- a. -1
 - b. 1
 - c. 4
 - d. 5
 - e. 7
11. If $x < -4$ and $y = +3$, which of the following must be true?
- a. $x + y < -4$
 - b. $x - y > -4$
 - c. $x - y > +4$
 - d. $x + y < +4$
 - e. $x + y < -3$

-
12. Mike charges a \$100 fee, plus \$20 per can of paint needed to complete the job. Which of the following expressions represents the painter charge, in dollars, after using y cans?
- a. $100 y$
 - b. $100 + 20 y$
 - c. $20 + 100y$
 - d. $(100 + 20)y$
 - e. $102 y$
-

13. For which of the following values of x is 5^x NOT equal to $a\sqrt{y}$, where a and y are integers ?

- a. 2
- b. 1
- c. $\frac{1}{2}$
- d. $\frac{3}{2}$
- e. $\frac{2}{3}$

$$\begin{aligned}2x + 4y &= 2 \\ x - 2y &= 7\end{aligned}$$

14. In the solution to the system of equations above, what is the value of x ?

- a. 3
- b. 4
- c. 5
- d. 6
- e. 7

15. For all numbers s and t , let the operation \diamond be defined by $s \diamond t = s$ and let operation \bullet be defined by $s \bullet t = 2t$. Which of the following must be true?

- a. $s \bullet t = t \bullet s$
- b. $s \diamond t = t \diamond s$
- c. $s \bullet t = 2(s \diamond t)$
- d. $s \bullet t = 2(t \diamond s)$
- e. $t \diamond (s \bullet t) = s \bullet (t \diamond s)$

16. Which of the following must be equal to $yx + xz - yz$, for all values of x , y , and z ?

- I. $xy - z(x - y)$
- II. $x(y + z) - yz$
- III. $(x + y)(x - z)$

- a. I only
- b. II only
- c. III only
- d. I and II only
- e. II and III only

17. The average (arithmetic mean) of three numbers is 5. If one of the numbers is 4, what is the sum of the other two numbers?

- a. 8
 - b. 9
 - c. 10
 - d. 11
 - e. 12
-

18. If x is 4 less than p and p is 2 more than m , then what is the value of x when $m = 2$?

- a. -1
 - b. 0
 - c. 1
 - d. 2
 - e. 4
-

19. All of Mark's former students go to college.

If the statement above is true, which of the following must also be true?

- a. If Ethan was not Mark's student, then he is not going to college.
 - b. If Joelle goes to college, then she was not Mark's student.
 - c. If Ginger goes to college, then she was Mark's student.
 - d. If Stephanie was Mark's student, then she is not going to college.
 - e. If Steve does not go to college, then he was not Mark's student.
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20. If $a^2 - b^2 = 12$, and $a - b = 4$, then what is the value of ab ?

- a. $-1\frac{3}{4}$
 - b. $-\frac{1}{2}$
 - c. 0
 - d. $3\frac{1}{2}$
 - e. $4\frac{1}{4}$
-

$$\begin{aligned} 5x + 9y &= 14 \\ 15x - ky &= 38 \end{aligned}$$

21. For which of the following values of k will there be no solution to the system of equations given above?

- a. -27
 - b. -18
 - c. 0
 - d. 18
 - e. 27
-

22. For all numbers x and y , let $x \clubsuit y$ be defined as $x \clubsuit y = x^2 - 2xy + y^2$. What is the value of $(2 \clubsuit 4) \clubsuit 8$?

- a. 1
 - b. 4
 - c. 12
 - d. 16
 - e. 20
-

23. If $\frac{x+2y}{y} = 5$, what is the value of $\frac{y}{x}$?

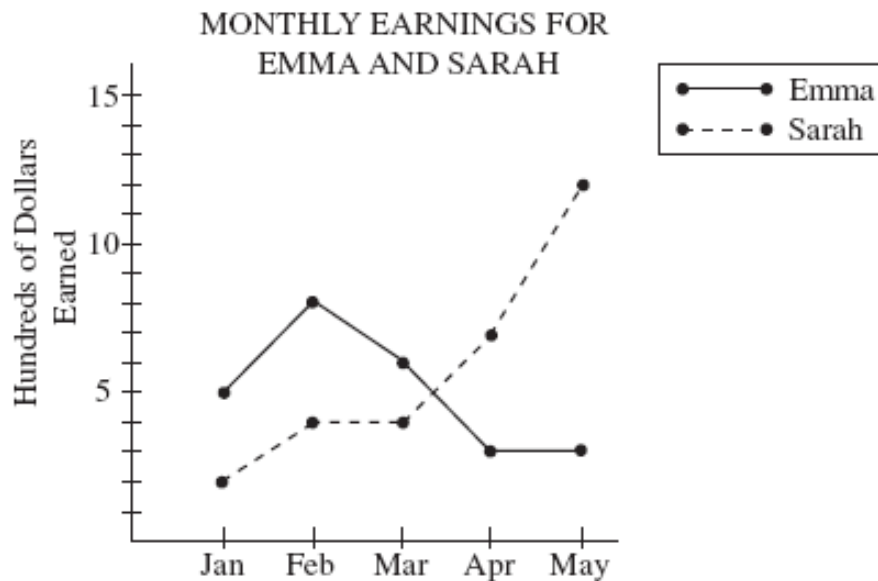
- a. -3
 - b. $-\frac{1}{3}$
 - c. $\frac{1}{3}$
 - d. 3
 - e. 4
-

24. If $f(x) = e^x$ and $g(x) = \frac{x}{2}$, $g(f(2)) = ?$

- a. 2.7
 - b. 3.7
 - c. 4.2
 - d. 5.4
 - e. 6.1
-
-

25. If $\frac{1}{x^{-2}} = 16$, which of the following could be the value of x ?

- a. -4
 - b. -2
 - c. 2
 - d. 3
 - e. 5
-



26. According to the graph above, for which month did Sarah earn \$400 more than Emma?

- a. January
 - b. February
 - c. March
 - d. April
 - e. May
-

27. The price of admission to the New Haven Children's Museum is \$6 more for adults than for children. If a group of 6 adults and 18 children pays a total of \$108 to visit the museum, what is the cost, in dollars, of the ticket for one adult?

- a. \$7.00
 - b. \$9.00
 - c. \$10.00
 - d. \$12.00
 - e. \$13.00
-

28. If the average of 8 and x is 10 and the average of 7 and y is 11, what is the average of x and y ?

- a. 9.0
 - b. 10.5
 - c. 12.0
 - d. 13.5
 - e. 15.0
-

$$\begin{aligned}3x + 4y &= -2 \\ x - 2y &= 11\end{aligned}$$

29. In the solution to the system of equations above, what is the value of $2x$?

- a. 4
 - b. 5
 - c. 6
 - d. 7
 - e. 8
-

30. Let a_n be defined for all positive integers as $a_n = \frac{a}{4} - \frac{a}{6}$ if $x_n = 3$ what is the value of x ?

- a. 18
 - b. 28
 - c. 36
 - d. 40
 - e. 54
-

31. If $f(x) = x^2$ for all real values of x , which of the following is not a possible value of $f(x)$?

- I. -4
- II. 0
- III. 2.3

- a. I only
 - b. II only
 - c. III only
 - d. I and II only
 - e. II and III only
-

32. If q is 4 less than r and r is 6 more than s what is the value of q when $s = 2$?

- a. -8
 - b. -4
 - c. -2
 - d. 4
 - e. 8
-

33. If $x^2 - y^2 = 55$, and $x - y = 11$, then $y =$

- a. 8
 - b. 5
 - c. 3
 - d. -8
 - e. -3
-

34. In a sports club with 30 members, 17 play badminton and 19 play tennis and 2 do not play either. How many members play both badminton and tennis?

- a. 7
 - b. 8
 - c. 9
 - d. 10
 - e. 11
-

35. If $x \oslash y = (x + y)^2 - (x - y)^2$
Then $\sqrt{5} \oslash \sqrt{5} =$

- a. 0
 - b. 5
 - c. 10
 - d. 15
 - e. 20
-

36. Which of the following describes the relationship between A and B as shown in the pairs of numbers in the table above?

<u>A</u>	<u>B</u>
2	5
3	10
4	17
5	26

- a. $B = A + 4$
- b. $B = 2A + 1$
- c. $B = 3A - 1$
- d. $B = A^2 + 1$
- e. $B = A^2 - 1$

-
37. The average bonus per employee was

- a. 81
- b. 91
- c. 100
- d. 101
- e. 10

The chart shows the amount paid in bonuses to the employees of a certain firm.

Bonus paid to an employee (\$)	50	100	150	200
Number of employees	7	37	4	2

38. . Refer to the chart from the previous question.

If median bonus amount = m , mean bonus amount = n , and modal bonus amount = p , which of the following represents the correct ordering of m , n and p ?

- a. $m < n < p$
 - b. $m < n = p$
 - c. $m = p < n$
 - d. $p < m = n$
 - e. $p = n < m$
-

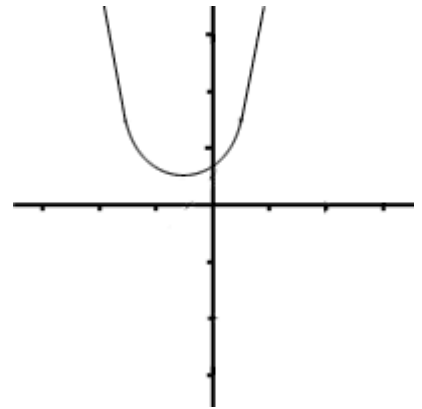
39. Which of the following is the equation of a line passing through the origin and parallel to the line $2x - y = 5$?

- a. $5x - y = 0$
 - b. $2x - y = 0$
 - c. $2x + y = 5$
 - d. $2x + y = 0$
 - e. $x + 2y = 0$
-

40.

The graph shows a quadratic function with a minimum at $(-1, 1)$. If $f(a) = f(1)$, which of the following could be the value of a ?

- a. 2
- b. 0
- c. 1
- d. 2
- e. 3



41. If $4x + 10 = 34$, then $x - 4 =$

- a. 4
- b. 7
- c. 10
- d. 2
- e. 8

42. If $y = 6x + 4$ and $6x + 8 = 44$, Then $y =$

- a. 46
 - b. 28
 - c. 22
 - d. 40
 - e. 24
-

43. . what is the average of $4x + 5$, $7x - 6$ and $-8x + 2$

- a. $x + 1$
 - b. $\frac{x+1}{3}$
 - c. $3x + 1$
 - d. $\frac{3x+1}{3}$
 - e. $(3x + 3)^{\frac{1}{3}}$
-

44. The equation $x^2 = 5x - 4$ has how many distinct real roots

- a. 0
 - b. 1
 - c. 2
 - d. 3
 - e. unknown
-

45. If $x + y < 10$ and $x - y > 12$ which of the following pairs could be the values of x and y ?

- a. (2, 6)
 - b. (6, -4)
 - c. (8, -4)
 - d. (8, -6)
 - e. (10, -2)
-

